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AORTIC DISEASE WITH ANOMALOUS SIGNS DUE TO ABERRANT CHORDÆ TENDINEÆ.

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The patient whose disease is about to be reported, first came under my notice in the Out-patient Department of the Royal Victoria Hospital early in the winter of 1896 He was a well-developed labourer of forty years of age. He complained of pain in the chest, which first began to trouble him after an attack of acute rheumatism in 1893. During the three years since that illness he had felt thoracic pain only occasionally, but in July of 1896 it became more severe and frequent, extending widely from beneath the sternum to the right and left and through to the back. Dizziness was sometimes felt. He was admitted to the ward on December 14th, 1896.

In his past history the following points are to be noted. He had done much heavy work. In 1880 he had a chancre, or, at least, the available history concerning an infection at that time, would lead one to conclude it was a chancre. In 1892 he was treated for a right-sided poptiteal aneurism by Dr. Shepherd (the femoral artery was ligated). In 1893 he suffered, as already noted, an attack of acute rheumatism, and about eighteen months before seeking advice, at the Royal Victoria Hospital, he sustained a severe strain in wheeling a heavily loaded wheelbarrow. It will be seen that sufficient cause for disease of the circulatory system will be found in the history.

His condition when first examined was that of a well-nourished man in a state of comparative comfort and well-being, with the complaints as above described. The skin showed signs of smallpox many years before. There was slight pallor of the mucous membranes; the sclerotics were icteroid. There was no œdema or dyspnœa; the finger nails showed slight clubbing; the inguinal glands were enlarged. There was a scar on the glans penis near the corona. The right thigh showed the cicatrix of a surgical wound made for the treatment of the popliteal aneurism, already mentioned The lungs, nervous system, abdomen, and urine gave negative results on examination. The chief interest centred about the circulatory system. The arteries were slightly sclerosed. The pulse was somewhat collapsing, of good tension, regular rhythm and volume. There was visible pulsation of the vessels of the neck: the carotids springing forward in systole. Palpation revealed a diffuse precordial pulsation with a prolonged diastolic thrill palpable on the right as far as the nipple line. The thrill was also palpable in the suprasternal notch, but its maximum intensity was about the third and fourth cartilages to the left of the sternum. The apex of the heart showed some displacment to the left, being located in the fifth inter-

space one inch outside the nipple. The transverse dulness encroached upon the left edge of the sternum. The sounds at the apex were decidedly weaker than normal; at the base one could not discover any accentuation of the second sound either pulmonary or aortic. At the apex a faint diastolic murmur and a systolic murmur were audible. In addition to these one could hear a musical murmur, diastolic in rhythm, widely propagated over the chest, having its point of maximum intensity, however, at the third left interspace. This murmur was of rather high pitch and was audible to the patient. It could be distinctly heard at a distance of from 18 to 24 inches from the chest wall, and on one occasion in a quiet room the murmur was audible at a distance of fully five feet, the patient dressed and sitting in a chair. The diagnosis of aortic and mitral regurgitation was made. Various speculations, however, were made concerning the origin of the murmur just described.

The patient was discharged, and for several months he passed from under our observation. He returned in May of 1898. About sixteen months of pretty active life with freedom from distress had been enjoyed, but in April he became very short of breath and his sleep was greatly disturbed by hideous dreams and attacks of dyspnœa. The complaints made on this occasion of admission to the hospital differed with those at first noted. Precordial pain was the prominent feature of the case at first; now he complained of sleeplessness and dyspnœa,—dyspnœa even when at rest, and sometimes amounting to orthopnœa.

Along with these allied complaints one found on examining the heart that the cardiac dulness had increased. The apex was now in the sixth space, the transverse dulness 1½ to 2 inches greater. There was epigastric pulsation. A thrill was uncertain. The musical diastolic murmur heard so widely was of a lower pitch, yet retaining its musical quality, but was no longer audible away from the chest wall. A "to-and-fro" murmur was heard at the xiphoid cartilage.

The patient wished to go home and was discharged on the first of June. He remained in bed until October 6th, when he was finally readmitted to the hospital, where he died on the 31st of the same month. The course of the case during the summer months was marked by hæmoptysis with signs of dulness (infarct) over the right lung at the base, and subsequent hæmorrhagic effusion, gradually increasing œdema of the extremities and body, the occurrence of hæmorrhoids, a diminution in the amount of urine with albuminuria, enlargement and tenderness of the liver with ascites, further increase of the cardiac dulness, and an occasional presystolic murmur at the cardiac apex. The musical diastolic murmur was constantly present, though not so plainly heard.

The treatment was directed towards the failing compensation of the heart, and consisted in digitalis, morphine, strophanthus, calomel, stry-

nine, potassium iodide, in various combinations and according to indications. The right pleura was twice aspirated. The œdema was relieved by multiple puncture of the skin under antiseptic precautions. He died very suddenly on the evening of the 31st of October.

The diagnosis of this case finally made was aortic insufficience, mitral insufficience with stenosis (?), myocarditis, arterio-sclerosis, secondary nephritis, right pulmonary infarct of lower lobe, and hydrothorax.

The autopsy confirmed the diagnosis with but one exception and revealed the cause of the anomalous signs. That condition which was always doubtful in this case, viz., mitral stenosis, was not found to be present and the presystolic murmur sometimes heard as compensation was more completely lost and must evidently have been the murmur of Flint associated with aortic regurgitation. But little interest attaches to the autopsy, apart from that which describes the cardiac condition.

Cor bovinum was found, the measurement being 14.25 cm. from side to side. The chambers were greatly enlarged, the right auricular walls were muscular; the tricuspid orifice admitted four fingers; the right ventricular wall was greatly hypertrophied. The mitral orifice admitted easily the tips of four fingers. The valve showed no thickening, the only abnormal condition about it, apart from the enlargement of the mitral orifice, being found in the insertion of one of the chordæ tendineæ arising apparently from a papillary muscle and attached fully one-half an inch from the aortic cusp upon its ventricular surface and somewhat to the left of the median line. Springing from the left side of the ventricle another fine tendon was seen to pass towards the muscle already described, and to join it just as it passes beneath the margin of this valve cusp as shown in the photograph. (Fig. 1.) Another shorter and somewhat coarser fibrous band united this papillary muscle to the ventrisular surface at a point adjacent to the first. The aortic valve was incompetent, the cusps being greatly thickened and shortened.

The anomalous signs in this case give it the interest it posesses:—

(1) It is anomalous to find *two diastolic murmurs*. We had the high-pitched musical murmur and the low-pitched characteristic diastolic murmur of aortic insufficience.

(2) It is anomalous to find a diastolic thrill so widely palpable. According to Gibson,—"They are rarely felt except in the precordial region, more especially towards the lower part of the sternum and in the neighborhood of the apex."

(3) A murmur audible so far from the chest-wall is rarely observed.

(4) With equal truth it may be said, further, that a musical diastolic murmur is an anomalous sign.

Concerning the cause of this quality of the murmur (4), we thought upon diverse possibilities, and chief among these was a condition of rup-

tured or distorted aortic cusp occurring in an atheromatous subject at that time when he sustained a heavy strain with an overloaded wheelbarrow. It is well known that the aortic valve segments are those injured most frequently by an over-strain, and some years ago C. Theodore Williams reported a case having a musical diastolic murmur which was subsequently shown to be due to a damaged valve-cusp, the border of which "was retroverted into the ventricle and vibrated in the regurgitant stream." Another possibility was that some fibrous band was floating in the blood stream, one end attached, or, perhaps both ends fixed. How true this last possible condition was the autopsy has shown. It would appear that this arrangement of the chordæ tendineæ is a congenital anomaly. They may find their point of valvular insertion at the edges or upon the ventricular surface of the valve, but rarely is it found so high up. Such an anomaly was without signs while the blood stream flowed in the normal direction; once regurgitation took place through the aortic orifice the stream of blood set these cords in vibration and, under the increased tension induced by a dilating ventricle and before myocardial changes became pronounced, the musical murmur was produced. Then followed the period of dilatation with muscular changes inducing loss of tone and both thrill and murmur became less pronounced.

Aberrant chordæ tendineæ, though comparatively rare, have been observed by many writers, and in some instances a diagnosis of their presence has been made during life. H. Huchard, in the *Revue de Médicine, 1893*, describes five cases, three of which were diagnosed during life. The greater number of such cases, Huchard believes, are congenital anomalies, while but a few are due to pathological changes, principally those due to atrophy of the left ventricular trabeculæ. They are very rarely found in any other chamber of the heart. Murmurs produced by them are associated with those found in the upper part of the ventricle, and are almost always systolic in rhythm and posess a musical quality.

Another point among many in cardiac cases, which the observation of this case teaches, is that relief of cardiac pain and the agonising features incident to the disease when the heart shows moderate hypertrophy, are greatly relieved when dilatation occurs, and, then, too, the other features of the case change. If you will remember, pain was the chief feature at first, when no œdema and no dyspnœa were present and the apex was in the fifth interspace; that when he came again for advice dyspnœa was great and the apex was in the sixth interspace and œdema supervened. This point was discussed by Musser in 1897.

BIBLIOGRAPHY.

Gibson--Diseases of the heart and aorta.
H. Huchard—Tendons aberrant du cœur, Revue de Médicine, 1895.
Peacock—Transactions of The Pathological Society, London, pp. 155, Vol. vi.
Burnay Neo—Transactions of The Clinical Society, London. pp. 155, Vol. vii.
Duckworth—British Medical Journal, Vol, ii., 1871.
Henry F. Lewis—The Clinical Review, December, 1898, and The Philadelphia Medical Journal, July 16, 1898.

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